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Bridging over the dynamic divide: when e-activities are e-learning reinforcement contexts

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Abstract: Digital divides take place when access to information and communication technologies or usage intensity in their various domains of application generate important gaps in means, knowledge, and overall development capabilities. As for ourselves, we have paid attention to a paradox, namely the knowledge obsolescence stress which affects the large group of those who are part of the Information society processes. As a matter of fact, due to the very nature of ICTs as fast changing socio-technological landscape, these users are constantly threatened to be left out in spite of their tenacious integration efforts. This dynamic divide cannot totally be dealt with by education and professional training only, and must also include the taking into account of generic skills acquisition. With this perspective in mind, we have analyzed, in a series of fieldwork research projects, and regarding the effectiveness of ICT-related learning programs, the relay and reinforcement potential constituted by e-activities as a collateral area to classical e-learning.

Key-Words: Digital divide, generic capabilities, e-learning, Information Society.

1 Tracing and tracking learning paradoxes in the area of ICTs

More than 500 million PCs and more than 2 billion mobile phones are already in use all over the world. These figures keep increasing and have even an enlarged diffusion perspective ahead, as such (PCs and mobile pones) or embedded in all sorts of everyday life objects. With this in mind, there is no need to emphasize the place and role that information and communication technologies (ICTs) have taken in contemporary society. They are becoming more and more pervasive, generating new communication and processing schemes, business opportunities and productivity enhancements and also, at the same time, inequalities, dependencies and risks to cope with.

Among the problems easy to identify and of which consequences are

undoubtedly worrying, is the question of the digital divide, with macro effects of making into a hierarchy, people, organizations and countries around the world, as well as more specific micro and local forms in each one or the socio-economic areas of the planet. We can also distinguish between "divide of the first order" (access vs. no access to ICTs) and "divide of the second order" (unequal usage intensity), the later re-inforcing the effects of the former, and altogether creating a vastly problematic situation. This level of attention, both in terms of statistical follow-up and bridging efforts is now a widely acknowledged, issue. In a recently achieved research project [1], however, we have identified and worked on a different and even more widespread kind of divide and thus pointed at new options to be explored in terms of training, or learning, accordingly, in the uptake of ICTs.

This paper will present our research' main results, establish the foundations of our hypothesis on the dynamic digital divide and outline the value of collateral perspectives we have analyzed as many e-learning channels giving in fact to any education related to ICTs their relevance, effectiveness and robustness. In particular, a series of key reflections and cases will support the hypothesis that these qualities are to a significant extent increased when built within e-community concerns, networked expertise and project-driven learning processes. The goal, in summary, is to provide insight and grounds not just for instrumental but also more generic and transversal skills acquisition.

2 Assessing bridging efforts in the continuing education arena

The digital divide is the cleavage that separates, on the one hand, those who have access to information and communication technologies (ICTs), who know how handle them and harness their resources and, on the other hand, those who have no access to such technologies or who do not how to exploit them in a satisfactory manner. Our project has consisted in examining the relationship between two variables: 1) what we have called digital integration, i.e., the level of access to and mastering of ICTs, by individuals or social groups; 2) social integration, which we have broken down into four dimensions constituting the social link (professional, social, political and territorial dimensions).

Digital integration, just like social integration, can be envisaged either as a "state" for a given moment (static dimension) or as a "process", which can evolve (dynamic dimension). In addition, these two types of integration can be dealt with in terms of objective criteria (factual or statistical data) as well as more subjective indicators (feeling of inclusion or exclusion as perceived by the individuals themselves). Our project focused mainly on the dynamic and subjective dimensions of integration or exclusion (digital and social).

After rather theoretical investigations, the empirical phase of our project has consisted in carrying out some 80 in-depth interviews (with a semi-directive approach), almost entirely with adults participating in continuation programs in the area of ICT training (mainly computers but also portable phones), as

well as with their teachers. In order to diversify possible points of views on the examined problems, fieldworks were chosen with the idea of combining several criteria: linguistic areas, central or on the contrary peripheral regions, gender, age, level of competence with ICTs, professional status of the persons being trained and type of training organizations.

Several observations are worth emphasizing, among which the following ones:

- the growing importance of digital integration, as a social norm, having consequences mainly in relation with the professional and interpersonal dimensions of the social link;

- the persisting feelings of digital exclusion as perceived by most individuals, in relation with the dynamic dimension of the digital divide (fears related with the permanent process which makes ICT competences obsolete);

- the importance of combining competences (technological competences with the capability to be constantly learning, as well as social competences, which involve basic skills such as literacy for instance), as far as providing access to ICTs is concerned;

- the absence of a strict correlation between digital and social integration, as we have observed several configurations not fitting the hypothesis of such a correlation.

As a consequence of our research work, we were able to make a series of policy-relevant recommendations, among which:

- the development of new frameworks for the teaching and the learning related to ICTs, so as to enable these technologies to be taken up in a generic form, without to strict a linkage with the employability potential of the persons concerned by such educational programs;

- a creative diversification of the teaching modes as well as the certification systems regarding the competences linked with ICTs;

- the promotion of ICT practices in connection with other possible measures in the area of social work (i.e., in favor of the unemployed, social integration policy, etc.).

This last item suggests a larger area of reference, for which other fieldwork research projects have helped us develop our understanding of meaningful correlations between among domains as education, health, work, home, leisure and transport. This background, which was explored in particular in the then pioneer perspective of Social shaping of technology applied to early Internet applications [2] has gradually suggested the strong intermediary role of e-activities for effective social learning in Internet-linked or associated multimedia projects and applications.

3 Focusing on the dynamic divide

We have made so far several hints at the idea of the dynamic digital divide. Before understanding how it can be treated in a bridging perspective, it is of

utmost importance that we define precisely what it consists of.

ICTs are configurational technologies [3] in the sense that 1) they incorporate components which improve in performance terms but also change constantly in nature (types of memory support, protocols and standards, etc.) and even in their servicing philosophy (buses, multi-threading, USB-like continuum, plug-and-play, etc.), 2) these components are assembled in platforms and turned into applications that improve and change themselves for users and usages that have evolved and keep evolving in a considerable manner, 3) defining individual trendy behaviors, but also forms or organizations, community styles, networking schemes and business models. In 2001, the Lisbon process, within the European Union, acknowledged the multiple nature of ICTs by emphasizing that the building of the Information Society had to account for a triple effect: 1) ICTs as an infrastructural industry of its own, with its dynamics and financial yield, 2) ICTs as a series of tools leading to some eventually intrinsic productivity increase and 3) a structural effect, fundamentally cross-sectoral and crucial for a country's competitiveness as well as more qualitative benefits for its citizens and inhabitants. This complexity raises obvious problems of uptake, on the part of countries, regions, organizations and finally individuals in all their settings and roles. Basically, all actors of the Information Society are supposed to contribute and obtain a better quality of life from ICT developments, but in reality dedicate constantly renewed efforts simply trying to keep up with the level of knowledge and know-how that it requires (Fig.1). At home, in the workplace, in the public space too, interactions with ICTs and their corresponding services are submitted to the incidental laws of the configurational pressure which we have evoked, with hard penalties and more or less worrying disintegration perceptions for those who for a reason or another loose track with it at some point of their life. Needless to say, almost everybody can be threatened by this stress [4], even ICT professionals if they become trapped in some technological or job position entrenchment.

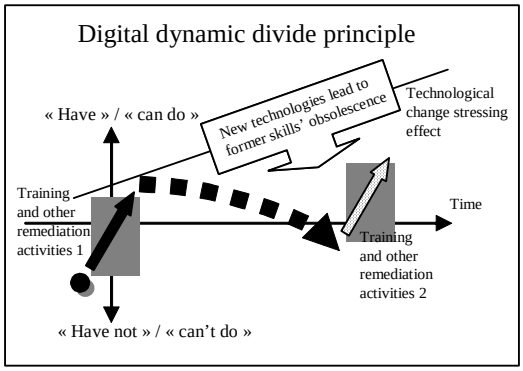

Fig.1 The dynamic digital divide

In reality, the dynamic divide exerts its effect in a highly varying way from individual to individual and even within the life trajectory of a particular individual. All of us seem to know that a perfect knowledge and know-how, at any given time of our life, as regarding ICT uptake, is impossible and we have learned how to deal with this imperfect nature of our ICT mastering. However, on a mundane basis, it is not always easy to identify when a relative knowledge becomes not enough and enters in a vicious circle of losing track. This ordinary process can be of course considerably reinforced by specific accidents such as the loss of a job, an emotional turmoil or even the lack of

financial resources to update equipment. In other terms, everyone "muddles through" but tends to lack the meta-knowledge and references to adequately identify when too little means a threat at a wider scale (Fig. 2).

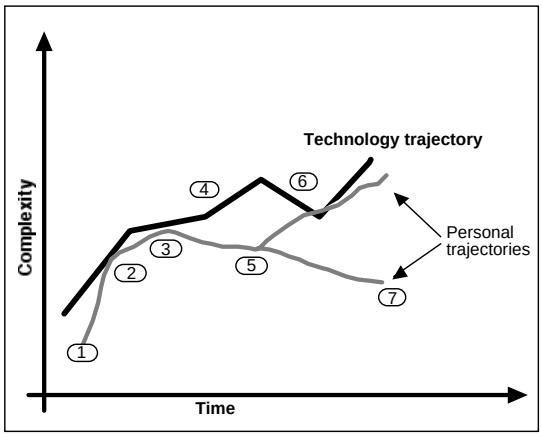

Fig.2 "Muddling trough" ICT skills

Figure comments:

1. *Starting point.*
2. *Initial learning which allows a reasonable mastering the technology.*
3. *Tolerance area corresponding to the "muddling through" philosophy (i.e. the French concept of "bricolage"), namely a level of mastering which is clearly not absolute but sufficiently maintained by self-learning to be operational.*
4. *Technology evolves in a quite constant way (with the famous software "updates") but also by jumps ahead (new software versions, new types of applications or even new systems and new operational philosophies which may be rather disruptive.*
5. *Having to cope with these situations, the user may or rather must get new training, both formally (courses) and informally (self-training, interactions with other users).*
6. *The technologies do not always improve in the same direction, towards more features and performance indicators or even complexity. There maybe, occasionally expressions of a motivation towards more simplicity, which can have various forms (interface re-use, procedure simplification, "quick uptake versions" for non professional users, etc.).*
7. *If the learning curve is too steep, some of the users may drop out or are driven out of the possibility of acquiring new ICT-related skills.*

Pressure towards continuous change may also lead some users to loose track and eventually drop out, in particular when the motivation for the acquisition of competences necessary for the mastering of new technologies fade away

In order to cope with the dynamic divide, we have observed that procedural and modular educational programs, typically structured and broken down into independently accessible learning pieces, which can gradually integrated into a full credit line and finally a diploma are rather unfit. They overlook the possibility to include the versatile dimensions that informal and vicarious learning provides and seems to adhere, on the contrary, to the shaping effect of the digital dynamic divide: you learn something and it is already programmed to become obsolete. Instead, we have tried to pinpoint the kind of capabilities that people who are successful in coping with the constant evolution of ICTs develop, mostly a mix of formal and informal acquisitions. We have therefore attempted to understand better the

features of the informal part of the mix. Our hypothesis is that they are generic and versatile. They can serve for a variety of applications and situations, now and in the future, with minor modifications and they have several modes of existing and exerting their benefits. This flexible "genericity" corresponds to already established theories [5] but has to be analyzed as such in the context of ICT uptake.

4 Emphasizing the complementary need for generic skills acquisition: e-activities as a resource arena

Quite early in our research projects on learning dynamics, either on ICT uptake processes or on the use of ICT to learn on other domains (e-learning in its general perspective), we have pinpointed the value of informal, fuzzy and above all generic forms of learning, enabling the learner to cope with the constant changes of ICT, knowledge linkages and applications' environment. But to a large extent, we were short of being capable of explaining what features would qualify a competence to be "generic", Our most recent study [1] allowed to be more specific and document several links which had already emerged before, but were this time explicitly mentioned as relevant for learning re-inforcements. It seems that the concept which best conveys all the potential of the various dimensions we wanted to emphazise is precisely the fuzzy and plastic notion of e-activities. This catchword encompasses diverse types of interaction arenas in which social learning [2] takes place: the workplace, of course, but also the home (and by extension a large part of our e-leisure undertakings), public spaces (with other, complementary leisure segments or our activities) and all the types of relationships with e-business actors (banks, insurance companies, hospitals) and e-administration and e-government bodies, the educational channels, as for themselves, being tied to several of these places or constituencies. The strength of e-activities to embody such "tacit" learning dynamism is a combination between the diversity of situation in which problem-solving supported by ICTs has to be handled by the users and form redundancy through which the users can find analogies, approximate similarities and reasonable options for inter-domain knowledge self-transferring initiatives. In other words, the value-added yield is not "doing by learning" (comprising class-room learning and some aspects of structured e-learning), but "learning by doing" (even if this formula is too often claimed as positive) or "vicarious learning". Expanding on this reversed perspective a little but further, this means (hence the social learning claim) that:

1) every practitioner may consider others as potential resources to tap upon or to share and experiment with (including within intra- and inter-organizational ties and in the perspective of value-added chain or networking effectiveness);
2) in e-activities' situations we are learning all the time;
3) a given piece of knowledge may always have multiple insertion modes if not multiple purposes.

Most of what appears here in a research results' form has been explained to us by users trying to cope in their own terms with the programmed obsolescence of ICT and therefore of whatever training

they might have getting in this area. At this level, one would think that training organizations have failed to perceive this hidden part of their mission and miserably stayed confined in a strict and conservative approach to what teaching might be. In fact, in the interviews we have carried out with training personal, these aspects have been more than once mentioned. However, in practice, the mere necessity to have to qualify the trainees formally has consequences often leaving aside real chances for combining the value of structured education with the informal "muddling through" that makes it robust and valid in actual interactions and organizational settings.

5 E-learning in the area of ICTs as a paradigm?

So far we have explained the behind-story of learning on ICTs, building on the idea that e-activities were the kind of redundant environment needed for that kind of uptake, given the fast changing nature of these technologies and their applications. There remains to be assessed whether this hypothesis, quite well supported by research evidence in our case, applies to more general types of learning (e-learning in any given domain) or is mostly specific to ICTs and their intricacies. One could be tempted to answer: a little bit of both, since the use of ICTs to help learning processes take place still depends upon the evolving nature of these technologies, but in a relative way as only relatively consolidated tools are normally used for such educational purposes. However, as we postulate that e-activities are relaying and even re-forcing the value of learning's generic features (giving them real context, real time existence), we can infer that the fragility of learning ICTs is to a non negligible extent also true for any meaningful learning supported by ICTs and that a good pedagogical "mix", involving generic features should be envisaged by training organizations, regardless of content or domain.

References:

[1] Vodoz L., Rossel P., Pfister Giauque B., Glassey O. and Steiner Y., *Ordinateur et précarité au quotidien: les logiques d'intégration provisoire de la formation continue*. Lausanne: C.E.A.T. [Rapport final PNR 51, Fonds national suisse de la recherche scientifique, 2005, 202 p.

[2] Williams R., Slack R. and Stewart J., *Social Learning in Multimedia*. Final Report to EC Targeted Socio-Economic Research Project 3131 PL 951003. Edinburgh: Edinburgh University, 1999.

[3] Kai J., Procter R. and Williams R. Standardisation, Innovation and Implementation of Information Technology. In: IFIP TC9/HCC5 (ed.). *Computer and Networks in the Age of Globalisation*. Lausanne: INFORGE-UNIL, 1998, p. 75-84.

[4] Our study showed that the only ones who do not feel the pressure of the dynamic divide are on the one hand professionals well trained and positioned in their activity and on the other hand, poorly educated and low income, half marginalized people who are in fact, paradoxically, less sensitive to the constant evolution of hardware and software applications.

[5] Let us think for instance of Bateson's learning levels ("I learn and meanwhile, I am learning things, which can serve in other circumstances and also learn how to learn), all meta-knowledge levels which have proved to be as essential as

the instrumental acquisition targeted in the first place (the thing that I learn about).

[6] See for that, the “Mode 2” approach: Gibbons M., Nowotny H., Limoges C. and Schwartzman S., *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*. London: Sage, 1994.